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The Effect of Red Onion Compresses on The Decrease Children's Body Temperature Fever

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ABSTRACT

Introduction: Children with developing immune systems are particularly vulnerable to various illnesses, including fever. As a result, this study aims to explore the potential benefits of using a red onion compress as an alternative method to reduce body temperature in febrile children.

Method: This research adopts a pre-experimental approach, utilizing a one-group pretest-posttest design to assess the effects of the intervention. The study population consisted of 15 individuals, and a non-probability purposive sampling technique was used to select 13 respondents. The research was conducted between October 1st and October 31st, 2023. The independent variable in this study is the application of a red onion compress, while the dependent variable is the reduction in body temperature among children with fever. Standard operating procedures for administering the red onion compress and observation sheets were used as research instruments. Data were analyzed using a paired sample t-test with a significance level of $\alpha<0.05$.

Results: Prior to the application of the red onion compress, respondents were categorized as febrile, with an average body temperature of 38°C. After the intervention, body temperatures returned to normal levels. The results indicate a statistically significant effect of the red onion compress in reducing body temperature in febrile children, with a p-value of 0.001.

Conclusions: The use of a red onion compress may serve as a viable complementary treatment for reducing fever in children, potentially offering an alternative to chemical medications. Future research could explore the effectiveness of red onion compresses in comparison to other natural remedies, such as peppermint oil or aloe vera, in reducing fever in children. This would help establish whether red onion compresses are more or less effective than other traditional treatments.

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1. INTRODUCTION

Maintaining children's health becomes a special concern during the change of seasons which is generally accompanied by the development of various diseases, children's condition goes from healthy to sick (WHO, 2013). Resulting in the body reacting to increase the temperature which is called fever (Kailasari, Cahyaningrum, and Suryani 2023). Children under 2 years of age are more likely to get fever because they still have a low immune system and it is best to avoid giving medicines that contain chemicals as early as possible. Negative impacts if fever is not treated immediately are dehydration, lack of oxygen, neurological damage, febrile convulsions. Fever must be handled properly so that negative impacts are minimal (Arisandi and Andriani 2012).

The WHO reports that the global incidence of fever ranges from 16 to 33 million cases, with children aged 5 to 18 being most commonly affected (Anggraeni, Immawati, and Dewi 2021; Organization 2013). Pathak et al. (2020) study in India found a 47% prevalence of fever among children with infections. Indonesia exhibits a higher incidence of fever

compared to other countries, with approximately 80-90% of reported fever cases being classified as simple fever Kemenkes RI (2018). From a survey conducted at the Kepatihan Community Health Center, Menganti District, Gresik Regency, there were 2746 children under five with 43 cases of fever in 2023. The results of interviews with 10 mothers showed that 8 out of 10 children were given chemical drugs to lower body temperature. when they have a fever, apart from that, 2 out of 10 mothers use red onions to lower their child's body temperature when they have a fever. Mothers complain about oral medication or food medication obtained at the community health center because it is difficult for their child to take medication, so the medication is not given optimally to the child. An interview with the head of the community health center revealed a limited utilization of non-pharmacological interventions for fever, including the application of red onion compresses in pediatric patients.

Fever can be caused by excessive exposure to sunlight (overhating), dehydration or lack of fluids, allergies due to immune disorders (Carroll and Klein 2019; Ćurić et al. 2022; Larkin 2015). Normal body temperature is in the range of 36.0 c-37.5 c, body temperature by the bipothalamus which regulates the balance between heat production and heat loss. One way to reduce body temperature is through conduction and evaporation methods. Controlling fever can be done by reducing body temperature which has increased above normal, namely above 37.5oC (Hartati 2022).

Red onion Compress is a traditional medicine without chemicals and has minimal side effects because the substances contained in medicinal plants can be metabolized by the body (Susilawati et al. 2024). Using a red onion compress is easy and cost-effective, and it has been shown to result in a significant difference in body temperature before and after application (Sulistiyowati and Ajiningtya 2024). Red onion compress is a non-pharmacological action by grinding/chopping onions then mixed with eucalyptus oil and smeared on the body with the aim of lowering body temperature. Red onion can be given using the principle of hydrotherapy which is used as a compress or bath (Prastiyani and Silvitasari 2023).

Red onion contain an organic sulfur compound, namely Allylcysteine sulfoxide (Allin). Crushed red onion will release the enzyme allinase which functions as a catalyst for allin which will react with other compounds such as skin which functions to destroy blood clots (Kalyati 2023). Grinding red onion on the surface of the skin causes the veins to change size which is regulated by the anterior hypothalamus to control heat is released, resulting in vasodilation (widening of the blood vessels). The occurrence of vasodilation causes increased heat dissipation through the skin, enlarged pores, and evaporative heat loss (sweating), which is expected to result in a decrease in body temperature to return to a normal state (Potter, P.A. & Perry 2014).

Anuhgera et al. (2020), indicated a potential correlation between the mass of red onion applied and the duration of compression required to achieve a reduction in body temperature. Preliminary findings suggest that a larger quantity of red onion might correlate with a decreased compression time necessary to induce a therapeutic hypothermic effect. Through this study, the researcher aims to evaluate the effectiveness of red onion compresses in reducing body temperature in febrile children. By conducting this research, the study seeks to provide evidence-based insights into the potential benefits of using red onion compresses as a natural and accessible remedy for fever management in pediatric patients. The findings may contribute to alternative fever treatment options, particularly in settings where conventional medical resources are limited.

2. METHODS

Study Design

The type of research carried out in this study was pre-experimental with a pre-post test research design in one group (one group pretest-posttest design)

Population, Samples, and Sampling

The study will focus on children aged 1 to 5 years with fever, defined as an axillary temperature of 38.0°C (100.4°F) or higher, residing in the Kepatihan Community Health Center area. The total population is 15, from which 13 children will be purposively sampled based on specific criteria. Inclusion criteria include being within the specified age range, having a fever, residing in the target area, and having parental consent. Children will be excluded if they have a fever lasting more than 72 hours, serious underlying health conditions, are taking medications affecting body temperature or compress effectiveness, have allergies to onions, or have skin conditions that could be worsened by the compresses. This approach ensures that the sample is appropriately selected to yield reliable and applicable results for the study on the impact of red onion compresses on reducing body temperature in febrile children.

Instruments

The instruments used in this research are as follows: The independent variable is the red onion compress, while the dependent variable is measured using a digital thermometer and recorded on an observation sheet.

Procedure

Before giving the red onion compress, obtain informed consent from the child's parents. Prepare the compress by finely grating the onions and review the application instructions. Position the child comfortably and ensure they are relaxed. Demonstrate how to apply the compress to the

parents, then apply it to the child's back or axilla (right or left) for 15 minutes. Measure the child's temperature before applying the compress and record the result on the observation sheet. Apply the grated red onion smoothly and evenly. After 15 minutes, clean the area with clean water. Measure the child's temperature again after removing the compress and record this result on the observation sheet. Finish by washing your hands and using hand sanitizer.

Data Analysis

Data analysis in this study will employ the paired T-Test, a statistical method used to compare the means of two related groups. The paired T-Test will be applied to assess whether there is a statistically significant difference between the two sets of data.Therefore, a p-value <0.05 will be interpreted as evidence that the intervention or treatment has a significant effect, confirming an influence on the measured outcome.

Ethical Clearance

This research has received an ethical certificate approval from Health Research Ethics at the University's Faculty of Health Sciences Gresik. To ensure ethical standards in research on the impact of audiovisual health education on medication adherence in breast cancer patients, researchers should prioritize several key aspects. Firstly, obtaining informed consent from participants is crucial. Researchers must also ensure participant privacy, conduct thorough risk-benefit assessments, and implement robust data security measures. Providing adequate support to participants and addressing cultural sensitivity are essential, especially considering the potential vulnerability of breast cancer patients. By focusing on these elements, researchers can uphold ethical standards and contribute to meaningful and respectful research outcomes.

3. RESULTS

Based on Table 1, the results indicate that most of the respondents were 3-4 years old, with 7 out of 13 (53.8%). Of these, 9 (69.2%) were female. The majority of compressions were performed between 10:00 and 12:00, with 10 (76.9%) during this time. Before going to health services, 9 children (69.2%) had eaten. Most compressions (11 children, 84.6%) were done while the child was sitting. None of the 13 respondents (100%) took medication before visiting the health service. Additionally, 7 children (53.8%) were diagnosed with a fever.

Based on table 2, the data shows that before being given the red onion compress, all 13 respondents (100%) had a fever. After being given the red onion compress, the majority of 12 (92.3%) had a normal fever, with a significant value of 0.002 < 0.05, meaning there was an effect of the red onion compress. red to the body temperature of a feverish child.

4. DISCUSSION

Table 1. Frequency Distribution of Respondent Characteristics

No	Category	N	%
1	**Age**		
	1-2th	2	15.4
	3-4th	7	53.8
	5th	4	30.8
2	**Gender**		
	Man	4	30.8
	Woman	9	69.2
3	**When compressing a child who has a fever**		
	07.00-09.00	3	23.1
	10.00-12.00	10	76.9
4	**Consumption of food in children who have a fever**		
	Eat	9	69.2
	Do not eat	4	30.8
5	**Activities During Compressing**		
	Sit	11	84.6
	Play	1	7.7
	Sleep	1	7.7
6	**Medications For Children Who Have Fever**		
	Yes	13	100
	No	0	0
7	**Diagnosis of a child who has a fever**		
	Pharyngitis	5	38.5
	Fever	7	53.8
	Tonsillitis	1	7.7

Table 2. Body Temperature Before And After Red Onion Compress In Children With Fever

No	Suhu	Pre Intervention		Post Intervention	
		N	%	N	%
1	No Fever (<38˚C)	0	0	12	92.3
2	Fever (≥38˚C)	13	100	1	7.7
	Total	**13**	**100**	**13**	**100**
	Mean	37.9		37.3	
	Median	38		37.3	
	Std. deviation	.22418		.22532	
	Paired T Test	0.002			

The findings of this study conclude that the average body temperature before applying the red onion compress was 37.9°C, which dropped to 37.3°C after the application. Statistical analysis confirmed a significant effect of red onion compresses on reducing body temperature in febrile children. The initial findings show a clear reduction in body temperature following the application of the red onion compress, supported by statistically significant data. This indicates that the method is likely effective in reducing fever in children. However, while the drop from 37.9°C to 37.3°C is notable, it's important to

consider whether this change is clinically significant and how it compares to other common fever-reduction methods.

Regarding the respondents' gender, 9 out of 13 were female, aligning with Charkoudian & Stachenfeld (2014) research, which suggests that women's internal heat levels can rise due to the hormone progesterone. The simplicity of this method, requiring only 3-5 cloves of red onion, makes it a practical alternative for parents to reduce their child's fever. The correlation between the gender of respondents and the effectiveness of the compress aligns with existing research on the role of progesterone in body temperature regulation. However, with a small sample size of 13, and only 9 females, it may not be sufficient to draw a strong conclusion about gender-specific effects. Future studies could benefit from a larger sample size and a more balanced gender distribution to verify this observation.

Additionally, red onion compresses can improve blood circulation by causing vasodilation when applied to the skin, leading to sweating and evaporation. This finding supports by Sari & Muslimah (2023), which also demonstrated the effectiveness of red onion compresses in lowering the body temperature of febrile children. The practicality of using red onion compresses is a strong point, as it provides a simple, accessible alternative for fever management. The explanation of how red onion compresses improve blood circulation through vasodilation is plausible and supported by existing literature. However, more detailed physiological studies would be beneficial to fully understand the mechanism behind the temperature reduction and how long the effects last compared to conventional methods.

Rosemary & Harrson (2023) study confirmed that there was a significant difference in average body temperature between the red onion compress group and the control group, reinforcing the efficacy of this method in reducing fever. The study provides additional validation for the effectiveness of red onion compresses. However, the comparison between the compress group and the control group could be expanded with more details on how the control group was treated and whether other variables were controlled. This would strengthen the argument for the compress's efficacy and help rule out placebo effects.

The various nutrients in red onions, such as high levels of potassium, allin, allicin, and flavonoids, contribute to lowering children's body temperature by inhibiting the growth of microorganisms and providing natural antibiotic effects. Aligned with the research by Marefati et al. (2021), the nutritional content of red onions, such as potassium, allin, allicin, and flavonoids, offers a plausible explanation for the observed effects on body temperature. These compounds are known for their antimicrobial and anti-inflammatory properties, which could contribute to the reduction in fever. However, while this explanation is scientifically sound, it would be beneficial to see direct evidence from studies specifically linking these compounds to fever reduction in children, as opposed to general health benefits.

However, a limitation of this study is that the pre-test and post-test results with red onion compresses may have been influenced by factors such as the respondent's initial health condition and any underlying comorbidities contributing to the fever. These factors should be carefully considered when interpreting the final outcomes of the study.

5. CONCLUSION

This study aimed to assess the impact of red onion compresses on reducing fever in children aged 1 to 5 years. The hypothesis was that red onion compresses would significantly lower body temperature. Results showed a notable reduction in temperature after applying the compresses, supporting the hypothesis. These findings suggest that red onion compresses may be an effective method for managing fever. Further research with larger samples and comparisons to other treatments is recommended to validate these results and understand the mechanisms involved.

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